NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, MULCH TILL

(Acre)
Code 329B

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round, while growing crops where the entire field surface is tilled prior to planting.

PURPOSES

This practice may be applied as part of a conservation system to support one or more of the following:

- Reduce sheet and rill erosion.
- Maintain or improve soil organic matter content and tilth.
- Provide food and cover for wildlife.
- Maintain or improve soil quality enhancing a favorable soil chemical and biological environment and nutrient availability through recycling source of plant residues.
- Conserve soil moisture, maintain adequate infiltration rates, and enhance water storage.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown and adequate plant residues are produced.

This standard includes tillage methods commonly referred to as mulch tillage, or chiseling and disking. It applies to mulching or fallow land, tillage for planting perennial crops, and where adequate plant residues are produced. Tillage operations shall be limited on steep land to minimize soil disturbance.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Loose residue to be retained on the field shall be uniformly distributed on the soil surface.

Combines shall be equipped with spreaders capable of redistributing residue over at least 80 percent of the working width of the header.

Residue shall not be burned.

Tillage implements shall be equipped to operate through plant residues without clogging, and to maintain residue on or near the soil surface by undercutting or mixing.

Planters, drills, or air seeders shall be equipped to plant in residue distributed on the soil surface or mixed in the tillage layer.

The number, sequence, and timing of tillage and planting operations, and the selection of ground-engaging components, shall be managed to achieve the planned amount, distribution, and orientation of residue after planting or at other essential time periods. Acceptable alternative tillage sequences shall be initially determined by a residue budget using locally applicable data on residue production by crops and residue reduction by tillage machines. Further adjustments shall be made, as needed during the tillage sequence based on field measurements of remaining residue.

Tillage operations shall be performed always maintaining at least 30% of the soil surface undisturbed through the cropping system.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Tillage operations shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed.

Additional Criteria to Provide Food and Cover for Wildlife

The amount of residue and height of stubble needed to provide cover shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values. Stubble shall be maintained standing over winter. Tillage shall be delayed until spring, in order to maintain waste grain on the soil surface during winter.

Additional Criteria to Maintain or Improve Soil Quality

The amount and kind of residues needed, soil type, texture, slope, and related oil properties shall be evaluated and determined using the current approved soil conditioning index procedure and soil quality indicators. Soil properties important to assess soil quality are the following: organic matter, infiltration, aggregation, pH, microbial biomass, forms of N, bulk density, topsoil depth, conductivity or salinity and available nutrients. Partial removal or residue by means such as baling or grazing shall be limited to retain the amount needed.

CONSIDERATIONS

Excess removal of plant residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air.

Mulch till may be practiced continuously throughout the crop sequence, or may be managed as part of a residue management system, which includes other tillage methods such as no till. Selection of acceptable tillage methods for specific site conditions may be aided by an approved Soil Tillage Suitability Rating.

Production of adequate amounts of crop residue necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacing.

Where improvement of soil tilth is a concern, use of undercutting tools will enhance accumulation of organic material in the surface layer.

By providing a choice of weed control method, this practice can reduce herbicide require-

ments when used in a conservation management system.

Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

On highly erodible soil beyond certain slope length and steepness, supplementary practice shall be required. Residues shall be distributed horizontally across a slope on contour or perpendicular to the prevailing wind on flat lands. Tillage tools operating depth shall be the minimum to facilitate farming systems.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and O&M described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

The following should be specified for residue management use: 1) The critical erosion period which the crop residue must be present, 2) The amount of crop residue, orientation and distribution that must be present to meet the planned purpose, and 3) Estimate percent ground cover or measure actual residue cover using the line transect method.

OPERATION AND MAINTENANCE

No operation and maintenance requirements, national in scope, have been identified for this practice.